Committee on Resources,

Subcommittee on Fisheries Conservation, Wildlife & Oceans

fisheries - - Rep. Wayne Gilchrest, Chairman
U.S. House of Representatives, Washington, D.C. 20515-6232 - - (202) 226-0200

Witness Statement

TESTIMONY OF
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BEFORE THE
HOUSE RESOURCE COMMITTEE
SUBCOMMITTEE ON FISHERIES CONSERVATION, WILDLIFE, AND OCEANS
AND THE
HOUSE SCIENCE COMMITTEE
SUBCOMMITTEE ON ENVIRONMENT, TECHNOLOGY AND STANDARDS
AND
SUBCOMMITTEE ON RESEARCH
UNITED STATES HOUSE OF REPRESENTATIVES
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Good afternoon, Chairman Gilchrest, Chairman Ehlers, and Chairman Smith, members of the subcommittees and staff. My name is Al Beeton, and I am the Chair of the Science Advisory Board (SAB) at the National Oceanic and Atmospheric Administration (NOAA). I would like to begin by thanking the Chairmen for inviting me to testify on the three important issues of ocean exploration, and the development and implementation of coastal and ocean observing systems, especially as they pertain to the Great Lakes.

I have many years of experience in dealing with many issues affecting the St. Lawrence Great Lakes. My research on the lakes commenced in 1955 and continues to the present. For years I served in various ways for the International Joint Commission, the Great Lakes Commission, and the Great Lakes Fisheries Commission. I was Director of the Great Lakes and Marine Waters Center and Michigan Sea Grant, University of Michigan; Associate Director of the Center for Great Lakes Studies, University of Wisconsin-Milwaukee, and Director of the Great Lakes Environmental Research Laboratory of NOAA.

The Science Advisory Board was established by a Decision Memorandum on September 25, 1997. It is the only Federal Advisory Committee with responsibility to advise the Under Secretary of Commerce for Oceans and Atmosphere on long- and short- range strategies for research, education and the application of science to resource management. The Board is composed of 15 eminent scientists, engineers, resource managers and educators that provide their expertise to ensure that NOAA science programs are of the highest quality and to provide advice and support to resource management. The latest Science Advisory Board meeting occurred two weeks ago in Santa Cruz, California, where the Board advised NOAA on fisheries science issues ranging from scientific quality of data acquisition to managing science in a regulatory environment, as well as on climate monitoring strategies.

Ocean Exploration:

The President's Panel on Ocean Exploration was a subset of the National Oceanic and Atmospheric Administration's Science Advisory Board which included six member of the Board. The Panel produced the report "Discovering Earth's Final Frontier: A U.S. Strategy for Ocean Exploration," recommending the establishment of a program of ocean exploration, from which the NOAA Office of Ocean Exploration was created. The Panel determined four key objectives for a national strategy in tackling ocean exploration: to map the physical, geological, biological, chemical and archaeological aspects of the ocean; to explore ocean dynamics to increase understanding of the ocean's complex interactions; to develop new sensors and systems for ocean exploration, and to communicate the new-gained knowledge effectively to stakeholders and the community.

Ocean Exploration in the United States began as early as 1807 when Thomas Jefferson authorized the Survey of the Coast, but despite of this, the ocean as well as the Great Lakes are understudied. Much benefit can be attained by furthering knowledge on ocean life, physics and chemistry, and better knowledge is translated into better advising by the Science Advisory Board. Concerning the Great Lakes specifically, the region would benefit greatly by updating bottom topography, as the area is vital to the country's shipping industry. The Great Lakes are also a very important region for maritime history and archaeology. An example is the Thunder Bay National Marine Sanctuary and Underwater Preserve in Lake Huron, where more than a hundred ships are suspected to have sunk there, but only 40 locations are presently known. Recently an expedition led by Dr Robert Ballard in partnership with NOAA and the State of Michigan surveyed the area using a new side-scan sonar and sub-bottom profiling technology called ECHO, and found 50-70 targets, where 10-15 are verified shipwrecks, 3 of them previously unknown.

I would like to add that despite the great public and scientific support behind the ocean exploration effort, the House mark failed to reflect this.

Coastal and Ocean Observations:

Coastal and Ocean observations are paramount for predicting events that affect commerce as well as human lives. Water-level change, floods, storms, and harmful algal blooms are a few of the disasters that may be predicted in the future to minimize financial and personal losses. Presently there are several independent coastal and ocean observing programs in the U.S.; the Harmful Algal Bloom monitoring program, the National Estuarine Research Reserve System, the National Water Level Observation Network (NWLON); and the National Status and Trends Program, to name a few. Because of the fluid nature of the atmosphere, lakes, and oceans they do not abide by geographical or political boundaries. Consequently, efforts in this area must be integrated regionally, nationally, as well as internationally, and the data collected made freely available to the greatest extent possible. A good example is the Integrated Global Observing Strategy Partnership (IGOS), an international partnership for co-operation in Earth observations established in 1998 by a number of international agencies concerned with environmental issues. The Ocean Theme is led by the Global Ocean Observing System (GOOS), charged with considering the full range of current and planned observations and identifying potential gaps in future observations that might compromise ocean observational records. Institutional structures are being developed to manage the total data flow, the production, distribution and quality assessment of relevant data products, and to work with end-users to ensure that the evolving system is responsive to their needs.

The Great Lakes:

Fresh water is a precious finite resource and about 68% of the fresh liquid surface water is contained in 189 large lakes of the world. About 18-20% of this water is in the Great Lakes. Consequently, about 40 million

U.S. and Canadian citizens use the lakes for drinking water and many industries and other business have located in the region because of this plentiful supply. The lakes are a major source of irrigation water, as well as for use of power generation, shipping, fisheries, recreation, and waste disposal. Despite the importance of this resource, relatively little attention has been given nationally and regionally, and funding to deal with serious problems have been limited.

Including and emphasizing the Great Lakes in legislation dealing with ocean exploration, and coastal and ocean observing systems will benefit the nation as well as the region. Ocean exploration activity will enhance the efforts to inventory and document the resources of the recently established Thunder Bay Marine Sanctuary in Lake Huron as well as resources of the Old Woman Creek Estuarine Research Reserve in Lake Erie. Aquatic resources of the Isle Royal National Park and other federal recreational resources would also benefit from this effort.

Ocean exploration activity should also provide for geophysical surveys to provide data to facilitate preparation of modern updated bathymetric charts for navigation, underwater structures, fisheries, and recreation. Most of the soundings now being used to provide detailed bathymetric charts are old. The most recent surveys were done in the early 1970's and they did not include all areas of the lakes. People making these charts had to use many data from the 1930's and in some instances data from the 1800's! Certainly it would be wise to have new information to prepare updated charts, especially in view of the very low water levels now being observed and the possibility of much lower levels as a consequence of climate change.

We know a great deal about the Great Lakes, but much if not most, of our knowledge comes from sporadic surveys, individual observations, short-term studies, and some monitoring at water intakes. We need long-term monitoring to provide the kinds of data essential to detecting subtle changes in the Great Lakes ecosystem in order to support suitable management of the resources. Such monitoring should be part of a Great Lakes coastal observatory system which would provide a coherent assessment of long term data as well as detect shorter term impacts. Data are needed on trends in water levels that affect property owners, shipping, and fish and wildlife, and the relationship of these trends to climate changes. Monitoring of coastal water quality is essential for public health reasons. For example a recent editorial in the Ann Arbor News stated that more than 100 beaches in Michigan are not regularly tested for bacteria concentrations. Only 12 of 41 counties regularly monitor for E. Coli. Long-term data are needed on fish populations, fish food organisms, ice cover and climate.

A number of studies have emphasized the need for regional coastal observing systems in addition to the need observed in the Great Lakes region; the National Ocean Partnership Program; NOAA Strategic Plan; and the U.S. Coastal-Global Ocean Observing System (C-GOOS). A Great Lakes Coastal Observing System has been identified as important to the region by the International Association for Great Lakes Research and the International Joint Commission's Council of the Great Lakes Research Managers. Such an observing system will be valuable to federal agencies, for example; EPA, USGS, NOAA, as well as State agencies, academic institutions, counties, cities and towns.

Recent advances now make it possible to develop and implement sophisticated coastal ocean observing systems and state-of-the-art ocean exploration techniques and instrumentation. New sensors are being developed which will allow acquisition of data rapidly and accurately. Acquisition of data which were very difficult to obtain using older time-consuming methods. In addition we have new and better ways to manage data, transmit data, and assess and use data. New technology, such as bio-monitoring systems using bioluminescent bacteria on light sensing computer microchips to detect low levels of toxic material or harmful algal blooms, are being developed. Funding for ocean exploration and coastal ocean observing

systems should be used, in part, to enhance capability.

Real-time data acquisition coupled with underwater image links connected to onshore viewing sites have a great potential to enhance public awareness and education. A coastal observing system placed at a marine sanctuary could enable visitors to observe underwater activity in a marine sanctuary and make the resources of the sanctuary a meaningful experience to a wider group of users.

I would like to thank you for the invitation to speak here today, and I will be glad to answer any questions you may have.

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